FIELD EXAMINATION REPORT

LITTLE PUDDING RIVER WATERSHED
(Lake Labish)

MARION COUNTY

OREGON

JULY 1955

C O N T E N T S

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Field Examination Report

INTRODUCTION

This report has been prepared to supplement and complement the information made available in the application of the sponsoring group. It is intended to furnish a background for determining watershed project feasibility and for approval or disapproval of the application by the State Engineer of Oregon and the State Conservationist of the Soil Conservation Service.

This watershed is located in the Central and Western part of Marion County and is totally within the Soil Conservation Districts. There are three of these districts involved, namely; Santiam, Silver Creek, and Mt. Angel Soil Conservation Districts.

The nearby shopping and marketing cities are Salem, Brooks, Mt. Angel and Silverton.

It is unique inasmuch as the principal damages of floodwater are caused by backwater from the Pudding River of which the Little Pudding River is a tributary.

The principal interest of the farmers is to protect the bottom lands, which are known as the Lake Labish Area, from the late spring and early summer floods of the Pudding River. These damaging floods occur during the vegetable planting time and/or early season growth period.

There are two distinct areas with varied enterprises, the valley floor (Lake Labish) and the upland benches. The valley floor is almost entirely devoted to the raising of onions while the upland bench farms are of a diversified type, raising strawberries, cane fruits, nuts, tree fruits, hay, pasture and grain. Dairying is a very important industry on many of the bench farms.

The following organizations assisted in the Field examination: The State Game Commission, State Fish Commission, State Engineer's Office, State Extension Service, U. S. Forest Service, U. S. Fish and Wildlife Service, and the U. S.Soil Conservation Service.

WATERSHED CHARACTERISTICS

TOPOGRAPHY

The watershed is about 15 miles long, and from 4 to 5 miles wide. Elevations range from about 120 feet at the confluence with the Pudding River to approximately 700 feet at the southeastern most part. Lying in the valley floor of the Willamette River Basin, the drainage consists of a gentle sloping alluvial plain, with rolling hills and low ridges. Lake Labish, which is a special feature of the area, was originally a natural swampy lake formed by poor drainage and by backwater of the meandering Pudding River. It is now drained and used as agriculture crop land.

SOILS AND GEOLOGY

The Lake Labish bottomland was formed under bog or half-bog conditions. The bottomland is comprised of organic and mineral materials laid over old valley-filling materials. The depth of organic materials varies, but usually becomes deeper as it nears the middle of the old lake bottom. Also, its depth decreases as it nears the outlet of the lake into Pudding River. At the outlet the materials are of mineral matter of very fine texture and very slow permeability.

The topography of the bottomland is nearly level, with some lower lying depressions. There is a few hummocks and knolls throughout the bottom. The bottomland is surrounded by abrupt moderately steep terrace fronts of old valley-filling materials.

The land is comprised of organic and mineral soils. The mineral soils being found in the smaller drainageways and along the lake side. The area around the outlet is composed of mineral soils probably deposited by overflow from Pudding River.

The upland topography varies from the gently rolling old valley-filling terraces with some steep terrace fronts along Little Pudding River, to the gently to steep sloping red hills area. The area along the steeper breaks is usually shallow and stony in the hill areas.

The soils formed on the old valley-fill material vary in their stage of development and characteristics.

The soils developed in red hills residual from basalts show less variation in their development. The most variation is in depth. These soils are well drained and vary in depth from shall to very deep. There are some stony areas with rock outcrop along most of the breaks.

RAINFALL

The broad lowland of the area has a relatively equable climate and is characterized by warm dry summers and cool winters, with moderately abundant rain and some snow. The precipitation, rain for the most part, occurs largely in the winter and early spring; even in the wettest year of record in the area, the summer rainfall was only about 4.3 percent of the total precipitation for that year and 7.4 percent of the average yearly rainfall. The average annual precipitation at Salem, which is on the western side of the watershed, is 37.22 inches, most of which occurs as gentle rains. The average number of days with 0.01 inch or more of precipitation is from about 130 to 160. However, between May and September precipitation at excessive rate occasionally continues for an hour or less. The maximum hourly rainfall intensity recorded in the area for such storms amounted to 1.31 inches. Much higher rates have been recorded for shorter intervals.

FLOODWATER RUNOFF

The watershed of the Little Pudding River lies at a relatively low elevation and ordinarily the flooding of the river is due to seasonal runoff caused by gentle rains. There are occasional high intensity rains of s hort duration at various times of the year. However, the flood flows are largely the result of maximum rainfall received during the period of November through February. Individual storms may be quite extensive, lasting for two or three days.

The flow stages of Little Pudding River near its mouth are also affected by the flow characteristics of Pudding River. The Pudding River with a watershed area of approximately 210 square miles above its confluence with the Little Pudding River, may, under certain conditions of flood flow, cause backwater to flow up Little Pudding River and overflow into the Lake Labish area.

AGRICULTURAL USES

The main agricultural uses of the flood plain and their approximate acreages are as follows:

Onions - 1200 acres,
Carrots - 12 acres,
Beans - 100 acres,
Celery - 10 acres, and
Some corn and mint, of which the acreages are not available, are also raised.

The cultivated land above the floodplain consists of both valley floor and hill soil types with approximately 15,000 acres of it being hill soil, and the remaining 22,000 acres located on the main upland benches and on the valley floor.

Approximately 9,000 acres of the hill lands are cultivated. This produces grass seed crops, forage crops, grain and other diversified crops.

On the valley floor many diversified crops are grown, including berries, beans, grain, legumes, corn, seed crops and many other of lesser importance.

That area of the Little Pudding watershed not under cultivation is in farm woodlot, native pasture, and broken rocky ground.

WATER SUPPLY

The water supplies of the area are good. In the lower watershed area, Pudding River generally flows some water all year, and a high water table makes possible the use of shallow wells. In the higher parts of the watershed, water may be obtained from natural stream flows, augmented by reservoirs and from shallow and deep wells.

OWNERSHIP AND TENURE

The owner operated farms in the flood plain would average about 15 acres in size, and cover 65% of the area. The remainder is leased or rented.

In the upper watershed the owner operated farms would average 80 acres and include 90% of the farm land.

WATERSHED PROBLEMS

FLOODWATER AND SEDIMENT DAMAGE

Floods occur annually in this drainage and can occur several times during the year from October through June. Agriculture damage is excessive and consists primarily of crop loss. However, land damage from erosion, leaching, scour and deposition contribute to the total flood damage figure.

The most costly floods are those that occur in May or early June when the main Pudding River crests and backs water into the Little Pudding River flood plain. These late floods inundate valuable planted crop land and, as a result, the crops are a complete failure or nearly so. As much as 2,000 acres of crop land are affected

by these floods and 1,400 acres are estimated to be flooded annually.

EROSION DAMAGE

Sheet erosion is responsible for much loss of land because this soil has a high organic content. The flooding of this land, especially following cultivation and planting, removes by floatation a great amount of material. Small gullies are observed around the periphery of the flood plain. These are caused by small pockets of water evacuating the area after a rapid withdrawal of the flood waters.

WATER USE AND MANAGEMENT PROBLEMS

Most of the watershed is a highly developed area, and the needs for irrigation a nd drainage have been fairly well provided for.

It appears that work in this area will continue at a reasonable rate of progress to improve existing irrigation and drainage systems, and to install additional facilities as needed.

PROJECT OBJECTIVES

LAND TREATMENT ON PRIVATE LAND

Continued improvement in drainage work can be expected as a result of the proposed program. This will consist of box drains on the peat soil and additional tiling of the heavier soil types found along the margins of Lake Labish.

It is estimated that 85% of the acreage in the upper end of Lake Labish has improved drainage practices installed while in the lower end of the area, this percentage falls off to approximately 65%. This is contributed to the flooded condition often prevailing in that area.

Several farmers in this area have asked for and received drainage assistance from the Mt. Angel Soil Conservation District within the last two years. It is felt that this program will be accelerated with completion of a flood prevention project.

Farm Conservation plans have progressed very rapidly during the last two years. The figure of 20% would probably be a relatively accurate estimate for the amount of area now under plan, the majority of which took place within the last two years.

With the entire watershed now included in one of the three districts, and with the soil mapping rapidly nearing completion, much progress can be expected within a relatively short time.

Some of the soil improving practices that are essential to the success of a conservation program in this area are: grass waterways, cover crops, green manure crops, conservation crop rotations, and other practices that provide ground cover.

FLOOD PREVENTION STRUCTURAL MEASURES

In the Little Pudding River there are not any dams, dikes or channels that are used for the purpose of flood control. On some of the tributaries there are several small reservoirs that are used to store water for irrigation. These dams are small structures that store a very limited amount of water; and the amount they store does not affect the floods in the bottomlands.

Measures which may be considered for flood prevention in the Little Pudding River Watershed are: enlarging the present channels, construction of a dike with an outlet structure having hand-operated or flap gates operating in conjunction with a pumping plant.

The present channels are used for both drainage and irrigation. It is not possible to enlarge them to handle the peak flows during the winter storms. The channel bottom is flat and the channel would take up too much valuable land - and the cost of right-of-way for such a channel would be prohibitive (approximately $1500 per acre).

The dike would be located on the North side of Sect. 7, T 6 S, R 1 W, of the W.M., near the junction of Little Pudding and main Pudding River. The dike would be about one-half mile long and approximately eight feet high. The dike could be used also as a county road.

The present county road has three wooden bridges, several curves, and is low. During some of the winter storms the road is covered with water and is closed to traffic for several days at a time.

The outlet structure would be reinforced concrete with a gate to prevent the water from the main Pudding from backing into Little Pudding. The gates would not be used except during May and June, or when the crops are planted. During the winter months the gates would be opened and the bottomland used as a flood plain for main Pudding as it is now.

The pumping plant would operate only when the crops are in, and would have only capacity enough to take the normal flow of Little Pudding during May and June.

It is believed that the foundation conditions are satisfactory for all the structures that would be needed.

IRRIGATION MEASURES

Most of the irrigation within the watershed is being accomplished by the use of sprinkler systems. On the bottom lands the source of irrigation water is from the flow of Little Pudding River or constructed open drainage ditches and shallow wells. On the upper portions of the watershed the irrigation water is obtained from shallow and deep wells (up to 200 feet) and small reservoirs.

The irrigation systems are predominantly portable systems - installed, owned, and maintained by the individual farmers.

In view of the small size of farms, the high value crops being grown, and the use of sprinkler systems, it appears that good irrigation efficiencies are being presently attained.

Much work is being done through the Agricultural Conservation Program and conservation planning within the watershed area to rehabilitate existing irrigation systems and the construction of additional small reservoirs.

Since the present water supplies are good, and in consideration of the sprinkler methods being used, it is not felt that irrigation benefits from the proposed project would be very extensive.

DRAINAGE MEASURES

In the bottomland, (Lake Labish) there is a main drainage ditch which was constructed to serve as an outlet for the lumber box drains. Of the 2,000 acres in the bottom, approximately 90 percent have closed drains.

The ditch is apparently operated and maintained by a cooperative association.

At the point where U. S. Highway 99 crosses Lake Labish, there is a small pumping plant to lift the water through a culvert and into another drainage ditch. This pump is only operated during the spring and summer and is used to lower the water in the ditch to provide an adequate outlet for a small area.

The present drainage system is adequately maintained and sections are replaced when needed. Lumber box drains are used in place of tile as it is too difficult to maintain alighnment with clay tile.

By construction of a dike, with an outlet structure, and pumping plant, the drainage systems which are now installed would function during the planting and growing season.

The winter floods and the backing up of main Pudding apparently does not carry enough silt to plug or damage the drainage systems.

RECHARGING UNDERGROUND BASINS

In the Little Pudding River Watershed no provision has been made and apparently not needed for recharging the underground reservoir. There is a natural recharging that takes place during the winter months when over 50 percent of the normal rainfall occurs. Also, recharging takes place when the land is flooded during the winter storms and from seepage from higher ground.

It appears that the recharging that takes place is adequate for the irrigation requirements of this area at this time.

FISH AND WILDLIFE HABITAT

Upon examination by representatives of the Oregon State Game Commission, U. S. Fish and Wildlife Service and Oregon Fish Commission of the area to be effected by these developments, it is believed that there is no problem of conflict with fish and wildlife interests.

Proposed developments may benefit wildlife through stabilization of the water level which would decrease the possibility of flooding of upland game nesting areas. If an impoundment is produced, there is a possibility of development of the impounded waters as a warm-water fishing area.

The only detraction that can be visualized at the moment is the possible reduction of use by waterfowl during the winter season.

These statements are based on the view that the development and construction will be carried out as tentatively proposed.

WATER RIGHTS

The main sources of water for irrigation are Little Pudding River and wells.

Permits have been issued by the State Engineer for the use of 27.04 cubic feet per second of water from Little Pudding River and its tributaries to irrigate 2120.1 acres. A substantial part of this area is in the Lake Labish area.

The quantity of water used for irrigation or other purposes prior to 1909 is not known as Pudding River and its tributaries had not been adjudicated. It is doubtful if much water was used prior to that year.

The quantity of water pumped from wells and the area irrigated therefrom are not of record in the office of the State Engineer.

Lack of sites precludes the storage of water in quantities sufficient to irrigate any large amount of land. However, there are sites which can be developed on an individual basis for the storage of a very limited quantity of water.

Little Pudding River and its tributaries are over appropriated. For irrigation during the summer it appears that the irrigators will have to look to ground water for their supply if it is available.

After August 2, 1955, pursuant to the Ground Water Code passed by the 1955 Legislature, it will be necessary to apply to the State Engineer for a permit to construct a well west of the Cascades and to use the water therefrom for irrigation.

PROJECT OUTSIDE OF WATERSHED

A going project should stimulate interest in similar types of programs on other watersheds in the county. It would compliment the Soil Conservation District programs of the Mt. Angel, Silver Creek, and Santiam Soil Conservation Districts.

A few people located immediately below this project have indicated some concern about the possibility of additional flood damage to themselves. In checking with the Corps of Engineers they have stated that any levy work at the mouth of the Little Pudding River would most likely have very little, if any, affect on downstream flooding.

OTHER PROGRAMS

The Corps of Engineers have proposed an irrigation and flood control program on the lower Main Pudding River. They believe that any watershed project, which might be designed in the Little Pudding Watershed under Public Law 566, would be complimentary to their proposals.

The project would benefit county and state road networks by reduced or eliminated flooding.

LOCAL INTEREST

SOIL CONSERVATION DISTRICT GOVERNING BODIES

The Mt. Angel Soil Conservation District is the sponsor of this project, and is prepared to work with the two other Soil Conservation Districts in establishing the land treatment program which would be developed. The Santiam and Silver Creek Soil Conservation Districts have expressed their willingness to cooperate to the fullest on their responsibilities.

URBAN PEOPLE

Much interest has been expressed by local people with the Salem Chamber of Commerce and Mt. Angel Business Men's Club, representing them by acting a s their official supporting groups for this project.

FARMER AND BUSINESS LEADERS

Many business leaders feel that such a project is very desirable and that it will not only be of direct help to the farmers, but an awakening to others as how such conservation measures would benefit all walks of life.

The Marion County Farm Bureau was active in the preparation of the application and have also endorsed it as a supporting group.

LOCAL PARTICIPATION

GROUP ACTION

There now exists a Lake Labish Cooperative which is responsible for maintaining and operating the present drainage system in the floodplain.

During the past several years many Agricultural Conservation Program pooling and farmer district agreements have been written and the conservation practices established. There has also been good cooperation within the flooded area by groups of farmers in the control of pests and in solving of their marketing problems.

SOURCE OF AVAILABLE FUNDS

Since there has been in the past some damage to county roads, the Marion County Court might contribute funds to facilitate better roads and to protect any construction which might be built.

After contacting several of the farmers, located within the watershed, it seems to be their opinion that a tax assessing organization could be developed to assess lands for the raising of funds for construction purposes; and in accordance with the State Laws condemmation proceedings could be included.

The Farmers Home Administration, local banks, and the Willamette Production Credit organizations are possible sources of funds for construction developments.

The sponsoring Soil Conservation District does not have any available funds at this time to carry on a watershed program.

ESTIMATED TIME TO COMPLETE PROJECT

The land treatment in the watershed area, with proper emphasis and concentra tion in this area, could be concluded in two years.

It is estimated that the structural measures, which would be required, could be installed in about one and one-half years time.

SUMMARY

This watershed's flood problem is unique inasmuch as the majority of the flood waters that do most of the damages do not originate in this watershed. They come from the main Pudding River which back floodwater on to the LakeLabish flood plain.

Based upon discussions with a number of the farmers whose land is subject to flooding, it is concluded that they have a sincere desire to see an effective flood control program formulated and placed in effect. A program which would, by means of all applicable measures, give some control of and protection from the periodic late spring and early summer floods.

The present flooding during the early crop growing season causes much loss. The highest losses are those of destruction of emerging seedlings, loss of valuable applied fertilizers, and some erosion losses. One of the main reasons for the large amount of the floodplain area being devoted to the production of onions appears to be that they are the one specialty (high income) crop which can be re-seeded, when needed, with some chance of enough growing season remaining to obtain a marketable crop.

Adequate flood protection would not only reduce the losses of fertilizers, seedlings, and soil, but also, and this is important, would enable the subject area to utilize the full growing season and enter into production of other high income specialty crops. Such a diversification of crops would do much to establish better crop rotations and probably result in a reduction of pest and plant disease damage.

It appears that some significant flood protection to this area could be accomplished by the construction of a dike with gate and pump controlled disposal of waters from the Little Pudding River.

Many of the farmers residing on the upland areas have already installed some of the needed soil conservation practices that would affect a proposed project. There is still a coordinated conservation program which should be developed on these lands.

All of the farms within the watershed are privately owned.

Any project that might be proposed would necessitate close working relationship with the Corps of Engineers.

At this time and as far as the field examination party could ascertain , and within the scope of the findings of the physical and economic possibilities, a watershed program would be practicable and feasible; therefore, we recommend the preparation of a Work Plan.